

# **CITY UTILITIES DESIGN STANDARDS MANUAL**

**Book 3  
Sanitary (SA)  
SA9 Low Pressure Sewer Systems**

June 2015

### SA9.01 Purpose

This Chapter establishes the minimum standards and technical design criteria for all City of Fort Wayne low pressure sanitary sewer systems including grinder pump stations and appurtenances. The main reason for acceptance of low pressure sewer systems is for septic elimination in areas of failed or failing septic systems. Low pressure sewer systems must be specifically approved by CUE for new development. All variances from these design standards must be approved prior to commencement of design in compliance with [Chapter GR3 -Variances](#).

1. This Chapter covers the following topics:
  - Low Pressure Sewer System Service Area
  - Responsibility
  - System Design and Layout
  - Maximum Connections to Grinder Pump Stations
  - Grinder Pump Type
  - Grinder Pump Equipment
2. The following topics are covered in other Chapters:
  - Drawings and Submittals ([Chapter SA4 – Drawings and Submittals](#))
  - Sewer Design ([Chapter SA5 – Sewer Design](#))
  - Lift Station and Force Main Design ([Chapter SA8 – Lift Station and Force Main Design](#))
  - Electrical and Instrument & Control Design ([Chapter SA8 – Lift Station and Force Main Design](#))

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### SA9.02 Low Pressure Sewer System Service Area

The applicant shall prepare a Low Pressure Sewer System Service Area Study where low pressure sewer system locations will be evaluated by City Utilities on a case-by-case basis.

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### SA9.03 Responsibility

The City will only be responsible for the operation and maintenance of the common force main, i.e. the main line low pressure force main, and the portion of the building sewer from the common force main to the right-of-way or easement.

The property owner shall be responsible for all piping, pumping equipment, and appurtenances between the building and the right-of-way or easement.

Refer to Standard Drawing [SAN-9-3](#) Low Pressure Sewer System Installation for a plan and profile view of the components and configuration.

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### SA9.04 System Design and Layout

Due to the variability of each site, the design of low-pressure sewer systems shall rely on sound engineering judgment and manufacturer's

recommendations. City Utilities may, if reasonably justified, make any requirement deemed necessary to assure the system performs as intended.

The minimum requirements for the design and layout of low-pressure sewer systems shall be per the most recent version of the Standard Detail Sheets, the manufacturer's recommendations, and as follows:

1. Pipe Size

Pipe size for the common force main shall be per pump manufacturer's recommendations. Minimum size of the grinder pump station discharge force main shall be one and one-quarter (1 ¼) inches.

2. Overall System Design/Layout

The design shall be as follows:

- Sufficient to achieve a minimum cleansing velocity of two (2) feet per second in the common force main, at least once per day; and
- Without any "loops" or parallel pumping segments in the system.

3. Cleanouts

Cleanouts shall be located per pump manufacturer's recommendations but at a minimum at the following locations:

- At the terminal end of each common force main; and
- Where two or more force mains are connected.
- Refer to Standard Drawing [SAN-9-1](#) Terminal Cleanout for Low Pressure Sewer Systems

4. Air Release Valves

Air release valves shall be installed at the following locations:

- All high points in the system; and
- At intervals of 2,000 feet on all horizontal runs lacking a clearly defined high point.
- Refer to Standard Drawing [STR-21-1](#) Sanitary Sewer Air Release Structure.

5. Building Sewer Connection

Refer to Standard Drawing [SAN-9-3](#)

- Builder and/or property owner to provide to City Utilities information on proposed pump system and force main alignment. Fort Wayne City Utilities will approve all grinder pump stations before commencing construction.
- All building sewer connections shall have two check valves on the discharge force main line from the grinder pump station.
- Builder and/or property owner shall contact City Utilities at time of grinder pump station and force main connection for waste discharge.
- Installation will be inspected by City Utilities.

6. Low Pressure Common Force Main Connection to Manhole

Refer to Standard Drawing [STR-22-1](#) Low Pressure Collection System Discharge.

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**SA9.05 Maximum Connections to Grinder Pump Stations**

No more than one building will be permitted to connect to a grinder pump station.

Common grinder pump stations for one building with multiple residential units are also prohibited, except for the following:

- Condominiums where different floors have different owners (only one building per grinder pump station).

The intent is to have individual residential units be served by individual grinder pump stations.

Industrial facilities will be handled on a case-by-case basis.

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**SA9.06 Grinder Pump Type**

To assure all the grinder pump stations are compatible, all units serving the same low pressure sewer system shall be the same make and model number, and have the same pump performance characteristics, unless justified.

Replacement units shall be the same make and model as was originally approved by City Utilities.

The type of grinder pumps and allowable applications are as follows:

1. Positive Displacement Pumps

May be used in all low pressure sewer system applications.

2. Semi-Positive Displacement Pumps

May be used in all low pressure sewer system applications.

3. Centrifugal Pumps

May be used in all low pressure sewer system applications. Consult with pump manufacturer for single-stage vs. two-stage applications. Two-stage centrifugal pumps may be required for higher total dynamic head applications.

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**SA9.07 Grinder Pump Station Equipment**

Simplex or duplex grinder pumps may be used for single dwelling units. For uses other than single dwelling units, the Engineer shall determine which is appropriate.

General equipment requirements are as follows:

1. Grinder Pump Station

The grinder pump stations shall be a complete package consisting of all equipment and appurtenances required for a fully operable pumping

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system. Pump, wet well, level controls, starter, alarm, piping, fittings, valves, and all accessories shall be part of a factory fabricated package so that after burying the wet well, the field connection of the gravity lateral, discharge line and electrical service line to the control box will complete the installation.

2. Manufacturer

Each grinder pump station shall be manufactured and assembled by a single manufacturer.

3. Pumps

The pumps shall be capable of macerating all materials in normal domestic and commercial wastewater, including reasonable amounts of foreign objects such as wood, plastic, glass, rubber, and the like to a fine slurry that will pass freely through the pump and 1 ¼-inch discharge pipe.

4. Electrical Motor and Level Controls

Electrical and level controls shall be provided by the pump manufacturer. All controls shall be mounted so they can be cleaned or replaced without disturbing the pump or piping.

5. Control Panels

The control panels and all associated components on each standard unit shall be U.L. Approved and installed per manufacturer's recommendations. All equipment associated with each unit shall meet the current requirements of all applicable Federal, State, and Local electrical codes.

6. Generator Hook Up

The grinder pump station shall be equipped with a generator receptacle for hook up.

The Engineer and manufacturer are responsible for assuring the equipment is designed properly and will operate in a safe manner.